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AUTHOR Fitzgerald, Daniel F.; Francis, Robert M.
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ABSTRACT

After the determination that the Principles of Accounting course offered at Herkimer County Community College, New York, had a higher attrition rate than other introductory courses, a study was conducted to develop a computer-assisted diagnostic system which could identify the learning deficiences of accounting students and prescribe corrective assignments on a week-to-week basis. The study involved: (1) the establishment of behavioral objectives for each instructional unit in the accounting course; (2) the development of diagnostic surveys for each instructional unit, utilizing multiple-choice and true/false questions; (3) the creation of individually tailored assignments directed toward specific student responses for each question on the surveys; (4) the development of a computer program to match survey responses with appropriate assignments; (5) the implementation of the diagnostic system in the accounting class; (6) the identification of student attitudes toward the system through questionnaires administered to course completers and to those students who withdrew from the course; and (7) the eventual comparison of course attrition rates after system implementation with rates experienced prior to implementation. The study report includes a review of the literature and examples of the behavioral objectives and prescriptive reinforcement assignments. (JP)

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THE DEVELOPMENT OF A DIAGNOSTIC TOOL TO LIMIT STUDENT ATTRITION THROUGH PROGRAMMED INSTRUCTION IN LARGE ACCOUNTING CLASSES

by

Daniel F. Fitzgerald, M.B.A.

and

Robert M. Francis, M. Ed.

Herkimer County Community College

A PRACTICUM PRESENTED TO NOVA UNIVERSITY
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THE DEVELOPMENT OF A DIAGNOSTIC TOOL TO LIMIT STUDENT ATTRITION THROUGH PROGRAMMED INSTRUCTION IN LARGE ACCOUNTING CLASSES

AN ABSTRACT

by

Daniel F. Fitzgerald, M.B.A.

and

Robert M. Francis, M. Ed.

This practicum dealt with the development of a method to diagnose student deficiencies early in the Principles of Accounting course in order to limit student attrition. The purpose of this project was to change the current attrition rate in the Principles of Accounting course to comparable attrition rates of other introductory courses taken by these same students.

Procedures used to develop the computer-assisted diagnostic system included a review of the literature to first identify the fact that computer-assisted instruction is a useful instructional device that can individualize instruction for different class sizes. The following phases summarize the additional procedures used:

1. It was determined that the Principles of Accounting course did indeed have a higher attrition rate than other introductory courses taken by the same students.

2. Behavioral objectives were established for each instructional unit and subunit and distributed and discussed in each class.

3. Surveys were developed as the criterion measure as to the achievement of the behavioral objective for each respective unit. Each survey consisted of multiple-choice and true-false questions based upon the behavioral objectives and related directly to each respective unit.

4. Individually-tailored assignments were established and directed toward specific student responses for each question on each survey.

5. A computer program was written in basic language utilizing the following equipment:

   1 1503 Disc System with large CRT
   3 1501 8K with Dual Serial I/O
   1 1551S Printer
   2 1512 Nine track 800 BPI Pertec tape

   The computer program was designed to diagnose individual student deficiencies and recommend alternative courses of action.

6. The surveys were given to each class at the end of each instructional unit. The student responses were entered on forms provided, computer scored and returned to the students before the next class session. From this data, the computer produced reports with prescribed corrective actions for each student and an item analysis for the instructor.

7. Upon completion of the Principles of Accounting course, two questionnaires were developed and administered to attest to the improvement of the educational process and to document whether or not the expectations of such a project were being met.

8. A comparison of attrition rates to compare success after utilizing the computer-assisted instruction will be completed using the same procedures that ascertained the higher attrition rate in the Principles of Accounting course.

FINDINGS

The development of a diagnostic tool to identify student deficiencies and thereby limit attrition in the Principles of Accounting course was the result of this study. It is hoped that as a result of the development of the diagnostic tool the number of students completing the course will be higher than in previous years and that the attrition rate will be reduced to comparable levels to that of other introductory courses taken by these same students.

RECOMMENDATIONS

As a result of this study, the following recommendations have been made:

1. That other kinds of studies should be conducted to determine the utilization of diagnostic methods other than for limiting attrition.
2. That computer-assisted instruction as a diagnostic tool should be given serious consideration for a permanent place in the accounting curriculum.
3. Some difficulty was found in coordinating some of the laboratory material with the current textbook. A study should be done to determine a closer correlation with professionally-prepared materials with current textbook usage.

DIVISION OF PROJECT RESPONSIBILITIES

The following delineates the division of project responsibilities:

Daniel Fitzgerald — Total Man-hours = 145

a. to develop and test the computer program to accomplish letters (a) through (e) below;
b. to develop a "study lab" in the library using present equipment to achieve the necessary corrective actions prescribed by the computer program;

Robert Francis — Total Man-hours - 165

a. to develop the behavioral objectives for each instructional unit in the Principles of Accounting course;
b. to develop a survey based upon the behavioral objectives of each instructional unit;
c. to develop prescriptions (corrective actions) for each survey question answered incorrectly;
d. to develop optional prescriptions utilizing the instructional resources already present in Herkimer County Community College's Instructional Resource Center;

e. to develop assignments for students scoring well on the survey to provide them with greater challenges.

Chapter 1

INTRODUCTION

Teachers who have worked with an average class size of forty students have often times been frustrated by their inability to deal with attrition and/or student deficiencies in time to do anything about it.[1] Typically, teachers with forty students in their classes had no idea that a student was doing poorly until the first exam or quiz, which was given some four to five weeks into the course. Usually, too, because of a class size of forty or more students, the teacher lacked the resources to deal with individual problems, and by the time the situation was diagnosed, it was often too late to be effective.

Concepts missed early in the course are the foundations for subsequent learning; once the student missed these foundations, he dropped out of the course, did poorly, or had difficulty with subsequent chapters.[2]

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[1]A study prepared by Mohawk Valley Community College, Utica, New York, indicated that the average class size for regional community colleges was forty students.

[2]Records examined over the past eight years indicated that these students had difficulty. A report of this information is provided in Appendix A.

The situation that developed with the lack of adequate and timely information regarding student deficiencies was that the teacher was proceeding too slowly or too quickly for the class as a whole--teaching the "average," whereby students were falling by the wayside unknown to the teacher. In addition, good to excellent students often wasted time on textbook problems and exercises providing little learning or challenges. Although the instructor taught the "average," and at a satisfactory pace, students at both ends of the continuum were experiencing problems.

PROBLEM

The problem addressed by this practicum was to develop a method to diagnose student deficiencies early in the Principles of Accounting course to limit student attrition.

PURPOSE

The purpose of this investigation is to develop a method that would change the current attrition rate in the Principles of Accounting course to comparable attrition rates in other introductory courses taken by these same students.[3]

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[3]For a comparison of attrition rates in the Principles of Accounting course and other introductory courses, see Appendix B.

SIGNIFICANCE TO INSTITUTION

The Principles of Accounting course at Herkimer County Community College has had a high attrition rate, a somewhat high student failure rate, low student morale and poor motivation for studying accounting.[4]

A solution to the attrition and failure rates can provide the following rewards:

1. Provide a feeling of student success rather than experiencing failure.
2. Enable the student to continue and complete his career programs in two years.
3. Maintain student enrollment in the business division and, therefore, continue his studies at Herkimer County Community College.
4. Provide student motivation to continue in the accounting program for accounting majors.
5. Encourage fellow colleagues to use alternative methods in teaching the Principles of Accounting course.

REVIEW OF RELATED LITERATURE

The solution to this project employs some of the oldest principles of learning but uses computer technology

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[4]A study of the attrition rates for the Principles of Accounting course at Herkimer County Community College is provided in Appendix B.

to provide each student with personalization and flexibility appropriate to his needs.

Although many well-known people could be associated with behavioral change, B. F. Skinner is probably the best known. B. F. Skinner contended that the "essence of learning by means of a machine lies not in the machinery but in the material to be presented. . . ."[5] The program is emphasized as the most important aspect of behavioral changes. Knowledge of results is essential for any program to produce the desired change. Since the teacher could not give all the reinforcement needed to the student, the importance Skinner places on reinforcement leads him to emphasize the use of programmed materials.[6]

Reinforcement (knowledge of results) plays an important role in successful learning. Commenting on the value of reinforcement, Garry wrote that:

> In experimental studies, where learners have been informed systematically of wrong responses and compared with another group systematically informed of correct responses, the learning rate of the latter group surpassed that of the former. There is a greater advantage in knowing what to do than in knowing what not to do in any situation affording a choice between [among] more than two alternatives.[7]

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[5]Ernest R. Hilgard and Gordon H. Bower, Theories of Learning (3d ed.; New York: Appleton-Century-Crofts, 1966, p. 556.

[6]Ibid.

[7]Ralph Garry, The Psychology of Learning (New York: The Center for Applied Research in Education, Inc., 1968), p. 67.

Thorndike's Law of Effect, later called reinforcement, and now referred to as knowledge of results, is the "fundamental law of learning and teaching,"[8] and applies to the desired behavioral changes by reducing or eliminating those that are undesirable.

Kelly and Anandam completed a study of a co-existence of faculty and computers which stressed the need for new alternatives in the teaching of community college students and stated that:

> Recent developments in higher education suggest that time has come for faculty and computers to bring together their unique talents in confronting the pressing challenges of the day. The doors of community colleges have been thrown open, wider than ever before, to accommodate a new influx of students--underachievers, minority groups, and the elderly, which makes heterogeniety a rule rather than an exception. Because the talents and deficiencies of these students differ so dramatically, the faculty is finding the task of teaching increasingly difficult.. Thus, individualization is no longer an intellectual proposition but a dire necessity.[9]

Davis and Farrand completed a study on rethinking individual instruction and indicated some of the logistical problems that seem inevitable due to student procrastination and stated that:

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[8]Geraldine M. Joncich, ed., Psychology and the Science of Education (New York: Bureau of Publications, Columbia University, 1962), p. 80.

[9]J. Terence Kelly and Kamala Anandam, "RSVP - An Invitation to Individualize Instruction," Community and Junior College Journal, March 1978, p. 24.

> There are still problems with individualized instruction, though most of these appear to revolve around the nature of the community college student rather than the type of instruction. Some of them concern motivation. The community college student may not be ready to meet the demands of this kind of course, or in some cases, of any college-level course. This is, in part, the result of the open-door policy of the community college. Often, the student not only lacks motivation but also lacks preparation in communication and study skills. Nevertheless, a course such as this should provide a student with the opportunity to progress and attain success within his limitations.[10]

Admittedly, this project benefits not only the student but, of equal importance, the faculty as well, many of whom are dealing with the new breed of student who cannot survive in a traditional atmosphere as referenced by J. Terence Kelly:

> In the end, developing such alternatives to teaching may encourage more positive faculty change than the sum of all conferences, workshops, and staff development sessions.[11]

APPROPRIATENESS TO MODULE

It is felt that this project relates appropriately to Learning and Theory Applications as identified by Losak when he stated:

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[10]R. M. Davis and Enid A. Farrand, "A Modified System of Individualized Instruction in Biology: Rethinking Individualized Instruction at the Community College Level," Journal of Science Teaching, XI, March 1977, p. 152.

[11]Sallie Brown and others, "Technology With Humanism Supports Learning," Community and Junior College Journal, May 1977, p. 27.

> . . . the intent of this course is to bridge the gap between theory and practice, and, through increased awareness on the part of the teacher, to improve learning in the classroom. While recognizing the enormity of the problem at the outset, an intense desire on the part of teachers to improve classroom learning is a significant factor in effecting change.[12]

In addition, the development of computer-assisted instruction systems is one of the answers to individualization of instruction. The flexibility of a computer-assisted system is perhaps the most important consideration in individual learning differences and relates to what Losak further stated:

> Of prime consideration in the application of learning theory in the classroom is the long-established fact of individual differences. People learn at different rates and in different ways, underlying a curriculum which does not allow for these facts detrimental to optimal learning.[13]

Losak also stressed that:

> Computer-assisted instruction (CAI) provides the teacher with a vehicle for individualizing instruction for all students, not just for the few at either end of the spectrum of scholastic aptitude. Not only does CAI take into account the principle of differential rates of learning, but at least two other well-established learning principles are incorporated into this teaching technique. First, learning is improved by rapid information feedback, and most CAI provides such feedback to the learner. Second, active participation by the learner is more conducive to learning than a passive role, and CAI requires the continued attention of the learner as subject material is presented. The advantage of distributed versus massed learning can be obtained

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[12] John Losak, Learning Theory and Applications, Section III, NOVA University, 1974, p. 39.

[13] Ibid., p. 41.

> by pacing the presentation of materials both daily and throughout the term, and by more frequent assessment of learning. Of course, more frequent assessment also provides the opportunity for the teacher to give students continuing feedback on their progress which also facilitates learning.[14]

The implied value of this project was not in the idea that overt responses, immediate feedback, and prescribed corrective actions will produce useful results in and of themselves, but rather that good educational materials can be made better through their judicious application and additional statements by Losak emphasized that:

> One classroom application of the principle of 'learning to learn' is the use by teachers of their first test as a 'trial,' not counting the score in the final evaluation of the student. This technique in effect, teaches the student how to prepare for the teacher's particular style of testing. This is a helpful technique for students new to the college setting, particularly those with no model (parents, sibs, or friends) from whom to learn 'how to learn' in a college setting. 'Learning to learn' also plays a significant role in the counseling (or therapeutic) relationship. Although the learning is in the affective realm and usually more difficult to achieve, it is believed that the same principles apply.[15]

The surveys used in this project constitute the same principles implied by Losak, namely, using the "trial" surveys to enable the student to gain insight into the realm of the college. The surveys also enabled the teacher to adapt to student learning deficiencies and to change his particular teaching style, or to provide different educational materials based upon student survey responses.

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[14]Ibid., p. 42. [15]Ibid., pp. 42 and 43.

The mission goal of Herkimer County Community College is to encourage everyone to learn according to his ability, and Herkimer County Community College has encouraged the creation of programs that fit the needs of students and the community. Thus, this project has helped fulfill the promise of the "community college," wherein, Losak states:

> In any case, there is no question but that the real concern of community college teachers is for techniques and strategies which will work with the academically underprepared student. . . and students strong in particular areas are provided instructional strategies designed to maximize their most effective approaches to problem solving.[16]

It is felt that the computer-assisted instruction approach is designed to help the slow learner and to challenge the strong student, as evidenced by the review of the current literature section of this practicum.

The behavioral objectives that were prepared for each instructional unit and the explanation of the purposes of such objectives does limit the apprehension, frustration, and anxiety in the student and adheres to Losak's following statement:

> In addition, it is known that high levels of anxiety can result in tunnel vision on the part of the student and can seriously impede cognitive processes. It is further true that ambiguity tends to increase anxiety for many people and that a student will generally learn better in a classroom setting where he knows what is expected of him and to what extent he is meeting these expectations.[17]

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[16] Ibid., p. 44.

[17] Ibid., p. 45.

One of the advantages of the project was the ability to provide feedback to the students before the next class session instead of waiting for several days or even weeks to discover that a student is having difficulty. Losak wrote regarding the importance of feedback that:

> All testing should contribute to more reliable, valid and rational decision making than would be possible without the use of the test. This is typically accomplished through the use of tests for diagnostic purposes followed by prescribed interventions suited to the strengths and weaknesses of students, and by providing feedback to the student concerning mastery. For maximum learning benefit to students, tests should be returned as soon as possible and opportunity provided for discussion.[18]

Again the project surveys given to the students served as tests, and as such, were congruent to the above quotation.

This project also has appropriateness to Learning Theory and Applications in the adult community served by Herkimer County Community College.[19] According to Knowles:

> The important implication for adult-education practice of the fact that learning is an internal process is that those methods and techniques which involve the individual most deeply in self-directed inquiry will produce the greatest learning. This principle of ego-involvement lies at the heart of the adult educator's art. In fact, the main thrust of modern adult-educational technology is in the direction of inventing techniques for involving adults in ever-deeper processes of self-diagnosis of

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[18] Ibid., p. 47.

[19] A study completed by Student Services at Herkimer County Community College dealing with student characteristics is provided in Appendix C.

> their own needs for continued learning, in sharing responsibility for designing and carrying out their learning activities, and in evaluating their progress toward their objectives.[20]

One of the intentions of this project is to involve the student in the self-directed approach and to develop shared responsibility of learning as quoted above.

In addition, we assert that the following principles of learning as stated by Ripple are very appropriate and applicable as each principle is inherent in this project:[21]

1. Focus pupil attention toward the desired learning outcomes.
2. Aid the learner in making and evaluating progress toward goals.
3. Provide for appropriate practice tasks.
4. Provide knowledge of results and correct inadequate responses.
5. Distribute practice and review.
6. Provide for sequential and cumulative learning.

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[20] Malcolm Knowles, The Modern Practice of Adult Education (New York: Association Press, 1970), p. 53.

[21] R. E. Ripple, Readings in Learning and Human Abilities: Educational Psychology (New York: Harper & Row, 1964), p. 42.

Chapter 2

PROCEDURES

The procedures employed in this project for the development of a diagnostic method to limit student attrition through programmed instruction at Herkimer County Community College involved the following steps:

1. A review of the literature was compiled to first identify the fact that computer-assisted instruction is a device that can individualize instruction for different class sizes.
2. A determination of the rate of student attrition in the Principles of Accounting course at Herkimer County Community College as compared with other attrition rates in other introductory courses taken by these same students was conducted. An examination of grades issued since the Fall of 1975 to the Spring of 1978 was determined. All grades given were identified (A, B, C, D, F, and withdrawal), tallied and computed as to the total passed, failed, or dropped as indicated in Appendix B. The attrition rate for the study was computed by adding the failing grades (F) and the withdrawing grades (W). The total was

then divided by the total number of grades for all students originally enrolled in the course. The percentage that results from this computation represents the attrition rate as well as the nonsuccess category. In essence, this computation equates nonsuccess to the attrition rate.

3. The textbook used in the Principles of Accounting classes was Accounting Principles, by Niswonger and Fess, 12th Edition. Principles of Accounting at Herkimer County Community College comprises the first nine chapters of this textbook.

4. A survey was constructed as the criterion measure as to the achievement of the behavioral objectives for each respective unit.[22] Each survey consists of multiple-choice and/or true-false questions based upon each respective unit or subpart as illustrated in Appendix D.

5. Individually-tailored assignments, exercises or study lab work was established and directed toward specific student responses for each respective

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[22]The course is divided into chapters. Each chapter is called a unit; each unit is divided into subparts where behavioral objectives are delineated. These units and subunits delineated by behavioral objectives are instructional units. See Appendix D for samples of the behavioral objectives and the surveys for the first two weeks. See Appendix E for an example of computer information on Student Performance Survey Results.

survey as illustrated in Appendix F, Part I. Additional assignments for reinforcement were also established and are illustrated in Appendix G.

6. A computer program was written in basic language utilizing the following equipment:[23]

   1 1503 Disc System with Large CRT

   3 1501 8K with Dual Serial I/O

   1 1551S Printer

   2 1512 Nine track 800 BPI Pertec tape

   The computer program was designed to diagnose individual student deficiencies and recommend alternative courses of action.

7. The system was introduced after the first week of instruction. In the initial introduction of the system by the teacher to the students, there was assurance that the survey was solely an informational gathering technique. A total of 16 surveys were prepared throughout the course; four were administered prior to the first examination; four prior to the second examination; three were administered prior to the third examination; and five were administered prior to the last examination. Each survey was designed to measure the

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[23]Other languages are applicable to writing this program, depending upon equipment at the respective institution.

achievement of respective behavioral objectives for each unit or subpart as described earlier.

8. The surveys were given to the class at the end of each instructional unit to identify student deficiencies. The Accounting classes at Herkimer County Community College meet for a total of 45 class sessions each semester. The student survey responses were entered on answer sheets; these sheets were the source document for a technical assistant to keypunch IBM cards. These cards were then fed into the Herkimer County Community College's computer which analyzed the student's responses with the computer program. From this data, the computer produced separate reports for the teacher, for each student and the class as a whole. Samples of these reports are provided in Appendices H and I.
9. The student's report was then made available to him in time for the next class session. Each student was instructed to pick up the surveys at the business division by the end of the following day. The survey identified precisely what the student was doing correctly and/or incorrectly, suggested ways to overcome these deficiencies, and provided individually-tailored assignments for each student. Using the information provided

by the computer, the instructor could more effectively allocate scarce lecture time by stressing only those principles that provided student deficiencies, as illustrated in Appendix I.

10. Upon completion of the Principles of Accounting course, two questionnaires were developed and administered to attest to the improvement of the educational process as a result of this project.[24] Since certain expectations are expected, the questionnaires were designed in order that these expectations are documented. The first questionnaire was distributed to each student who completed the course to demonstrate whether or not the expectations were met. The second questionnaire was given to each student who withdrew from the course to determine the reason for withdrawal and their attitude toward the new system. An illustration of each questionnaire is presented in Appendices K and L. Limitations regarding the questionnaires are described in the limitations section of this practicum.

11. A comparison of attrition rates after utilizing this method of computer-assisted instruction will

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[24]See Appendix J.

be completed using the same procedures as described in instruction Number 2 of this section.

LIMITATIONS AND ASSUMPTIONS

In considering the intent and scope of this study, the reader should be aware of the following limitations:

1. Because of the choice of words, the types of questions or question structure, there may be some ambiguity in the nature of the questions thereby producing an incorrect response.
2. The student population was limited to those students who were enrolled in the Principles of Accounting course at Herkimer County Community College, Herkimer, New York, as taught by one instructor. The instructor taught five sections of Principles of Accounting comprising 160 students using the lecture-discussion method and diagnostic surveys.
3. The study is limited to the student population taught by one instructor during the Fall, 1978 and the Spring, 1979 semester, comprising 160 students.
4. Students were assigned to the classes through the formal registration procedures in effect at that time. All classes carried the same course nomenclature and no designation of experimental

or conventional classes was made available to the students. The majority of the students were classified as full-time freshmen.

5. The questionnaires developed by these authors to attest to the documentation of meeting the expectations has no validity at this time. However, repeated issuance of these questionnaires will establish the validity and reliability.
6. The study is limited to the Principles of Accounting course as taught by one instructor and comparisons made between or among this study and other approaches of teaching and other collegiate courses cannot be generalized. On this limitation, Lumsdaine has commented:

> Experimental measurement of the effects of a single instrument apply only to that instrument, and generalizations of the results of such an evaluative experiment to other instruments of the media it represents have, at most, the status of untested hypothesis. Similar limitations apply when a comparison is made between the attainments effected by a particular instrument and those obtained by some alternate form of instruction often characterized as 'conventional' or 'currently used' instruction . . . .[25]

Holland further substantiated the point of non-generalizability by stating:

> A great many studies have compared programmed instruction with conventional methods. . . . Despite their prevalence, such studies lack validity in

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[25] A. A. Lumsdaine, Instructional Materials and Devices, Training, Research and Education (Pennsylvania: University of Pittsburg Press, 1962), p. 251.

> the sense that they do not permit generalization of the results beyond the particular instances used in the study.[26]

Coulson also warned that the Hawthorne Effect may be operating in a study of this type and may bias the results.[27]

The limitations were considered in executing the procedures necessary to develop the investigation. However, this study was conducted on the basis that the following assumptions were valid:

1. Each question on the survey was designed to meet specific behavioral objectives listed for each instructional unit.
2. Although there is always the possibility of the respondent answering a question he really does not understand, the assumption was that each survey uncovered any serious deficiencies.
3. The students would take the necessary self-directed inquiry approach required according to the computer-prescribed, corrective actions.
4. The students enrolled in the Principles of Accounting course included a normal population of students from Herkimer County Community College.

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[26] James Holland, Teaching Machines and Programmed Learning II: Data and Directions (Washington, D. C.: Department of Audio-visual Instruction, National Education Association of the United States, 1965), p. 107.

[27] J. Coulson, Programmed Learning and Computer-Based Instruction (New York: John Wiley & Sons, Inc., 1962), p. 116.

5. The individual teaching style of the instructor involved in this study was not a part of this study.

DEFINITION OF TERMS

During the course of this study reference was made to the terms cited below. These terms, along with their appropriate definition, should be helpful in understanding the intent and purpose of this study as well as assisting in the interpretation of the results. The terms are listed below in alphabetic order:

Attrition - as defined by the Student Services Department of Herkimer County Community College is based solely upon those students registered for each respective class and who have withdrawn officially or unofficially, and those who were dismissed.

Attrition Rate - refers to the percentage of students who did not complete the course based upon beginning and ending enrollments. The attrition rate for the study was computed by adding the failing grades (F) and the withdrawing grades (W). The total was then divided by the total number of grades for all students originally enrolled in the course. The percentage that results from this computation represents the attrition rate as well as the nonsuccess category. In essence, this definition equates nonsuccess to attrition rate.

Behavioral Objective - refers to a precise statement of what a student will be able to do as a result of the instruction received.

Computer Program - refers to the instructions provided to a computer.

Computer-Assisted Instruction - a comprehensive term that refers to instructional methods provided by a computer program that is prepared in advance and is capable of instructing effectively when initiated by the instructor.

Failure - refers to any student receiving a grade of F.

Full-Time Student - refers to any student who is enrolled in four or more courses.

Feedback - refers to communication to the learner and/or instructor information needed to modify responses so that failures, errors, or misinformation can be eliminated and corrected responses maintained.

Instructional Unit - subunits of each chapter which is divided into subparts where behavioral objectives are delineated.

Individually-Tailored Assignments - refers to specifically assigned exercises or study lab work geared toward students' needs.

Keypunch - refers to computer input data punched on a card enabling the computer to read the information.

Part-Time Student - refers to any student carrying less than four courses.

Principles of Accounting Course - this term according to the college catalog describes the course as including the fundamentals of posting, journalizing, worksheets and statements through the accounting cycle and periodic summary. Adjusting and closing entries, inventory valuation and depreciation are also covered.

Prescribed Corrective Actions - refers to specific student assignments to be completed by each student based upon his score on each survey.

Reinforcement, immediate - the process of providing the learner with immediate information regarding the success or failure of his performance.

Study Laboratory - refers to a central location in the Instructional Resource Center where specific accounting resources are available for the students.

Survey - refers to the criterion measure of the achievement of the behavioral objective consisting of multiple-choice and/or true-false questions based upon each respective topic.

Student Deficiencies - refers to any student answering an incorrect or non-appropriate answer to specific items on each survey.

Student Assignments - refers to the individually-tailored exercises assigned each student by the computer based upon his survey score.

Topics - refers to items covered in the instructional units.

RESULTS

The primary purpose of the project was to develop a method that would identify student deficiencies early in the Principles of Accounting course and thereby limit student attrition.

The project included five sections of Principles of Accounting classes taught by one instructor. One hundred and sixty college students acted as subjects in the study to determine the effect of a diagnostic system that would limit student attrition. A Student Evaluation Questionnaire was administered as a means of measuring the students' attitudes toward the system.[28] Students' attitude scores were used to make judgments regarding the system.

The system was introduced after the first week of instruction. In the initial introduction of the system by the teacher to the students, there was assurance that the survey was solely an informational gathering technique. The results of the survey would not be used for grading purposes but rather for determining their strengths and weaknesses. A total of 16 surveys were prepared throughout the course; four were administered prior to the first examination; four prior to the second examination; three prior to the third examination; and five prior to the last examination.

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[28]See Appendices K and L.

The methods and procedures used in conducting the study were divided into the following phases:

1. The establishment of behavioral objectives for each instructional unit by topic.
2. The establishment of the survey as a measure of achievement of the behavioral objectives. The criterion measure or survey consisted of multiple-choice and/or true-false questions based upon each respective topic. The behavioral objectives specified for each instructional unit was the basis for the preparation of the survey.
3. The prescribed corrective actions directed the student to various self-directed assignments.
4. A computer program was written in basic language to accommodate the individual needs of the student.
5. The administration of the survey to the students to determine students' achievement, which was given at the end of each topic covered. The surveys were scored by computer and returned to the students with prescribed corrective actions before the next class session.
6. The student was able to make corrective actions which enabled him to proceed to the next class session with a better understanding of the strengths and weaknesses.

7. Upon completion of the Principles of Accounting course, two questionnaires were developed and administered to attest to the improvement of the educational process as a result of this project.[29] Since certain expectations are expected, the questionnaires were designed in order that these expectations are documented. The first questionnaire was distributed to each student who completed the course to demonstrate whether or not the expectations were met. The second questionnaire was given to each student who withdrew from the course to determine the reason for withdrawal and their attitude toward the new system. An illustration of each questionnaire is presented in Appendices K and L. Limitations regarding the questionnaires are described in the limitations section of this practicum.
8. A comparison of attrition rates after utilizing this method of computer-assisted instruction will be completed using the same procedures as described in instruction Number 2 of the Procedures section.

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[29]See Appendix J.

As a result of this project, attrition will be reduced to comparable levels of other introductory courses taught at Herkimer County Community College and taken by the same students.

The results apply to one project, with one instructor, in a single community college, and in a particular course. Even if we assume that the project is methodically sound, the ability to generalize from this single study is limited.

As a result of this investigation, the following are improvements in the educational process:

1. Well-defined objectives are communicated to the student for each instructional unit.
2. The instructional units are small, logically sequenced increments that can lead to the learning of quite complicated subject matter.
3. The student takes an active role in his learning by providing continuous responses to the materials presented to him.
4. The student's feedback to his responses are immediately available so as to reinforce learning.
5. The material is individualized and flexible, thus enabling each student to progress through the materials.
6. The development and implementation of such a project will contribute to the students'

learning of Principles of Accounting.[30]

7. The student develops habits of a more meaningful, self-directed study and inquiry, and divorces himself from spoonfeeding and the passive role of the learner.
8. The establishment of learning objectives better identifies for the student his expectations of the course.
9. The development and implementation of such a project will produce a completely different classroom environment as the teacher and the students interact in a different manner than under the lecture system. The system combines the strengths of basic learning theory.[31] Going along with this is a highly personalized relationship among the instructor, the student, and the computer; therefore, the utilization of current learning-reinforcement theory makes for a very efficient student-oriented learning system.

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[30] See Appendix J.

[31] John Losak, Learning Theory and Applications, p. 42.

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

This study was undertaken to develop a diagnostic system of computer-assisted instruction to limit attrition in the Principles of Accounting classes. The major expectation was that attrition will be reduced to comparable levels to that of other introductory courses taught at Herkimer County Community College.

Perhaps the most important element relating to this project is that the system developed a means to pinpoint student competence. The information upon which the system operates is obtained from periodic samplings of student performance under non-examination conditions, using multiple-choice and true-false questions.

Admittedly, the surveys may not provide an adequate reflection of the creative or exceptional abilities of the very capable student; however, since this student can be identified as possessing an understanding of the basic concepts, the additional capabilities of this system in providing him with additional options can allow an accurate appraisal even of the more capable student.

The implications and recommendations presented in this section include only those which can be logically stated from the results presented in the previous section. While this limits the number of implications and conclusions that can be drawn, and while these results may be useful

to those who teach college-level accounting courses, the results should not be generalized to other student populations unless comparable student selection, teaching, and evaluation procedures are used.

The effect of reducing attrition to comparable levels to that of other introductory level courses would have the following implications:

1. To enable the students to experience success in completing the Principles of Accounting course.
2. To enable students to continue in the accounting program for accounting majors.
3. To enable students to continue and complete their career program in two years.
4. To schedule smaller accounting classes due to the fact that fewer students would be repeating the course.
5. To provide a better utilization of the instructional resources already present at the Instructional Resource Center.
6. To maintain student enrollment in the business division and at Herkimer County Community College.
7. A final, but extremely important, implication is the encouragement that this study will have on fellow colleagues as this project has the ability to pinpoint student achievement.

The following recommendations are made on the basis of this study:

1. The taped material and study guides used in the study laboratory were limited in the topics covered. Some difficulty was found in coordinating this material with the textbook used. A study should be done using a different textbook that is more closely correlated to the taped materials or developing additional tapes and study guides to be used with the assigned textbook.
2. Computer-assisted instruction as a diagnostic tool should be given serious consideration for a permanent place in the accounting curriculum. The American Accounting Association also expressed its position with regard to less traditional emphasis in accounting instruction:

> The traditional accounting department should be redirected and its scope should include the design, implementation, operation, and control of the data-information resources.[32]

The development and implementation of such a project will produce a completely different classroom environment as the teacher and the

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[32] "Designing a Computer Based Information System: An Intermediate Systems Course," Accounting Review, XLVII, Supplemental (American Accounting Associating Committee on the Use of Multi-media, 1972), p. 9.

students interact in a different manner than under the lecture system. The system combines the strengths of basic learning theory.[33] Going along with this is a highly personalized relationship among the instructor, the student, and the computer; therefore, the utilization of current learning-reinforcement theory makes for a very efficient student-oriented learning system.

The potential for improvement or positive changes, however, can best be summarized by Kelley:

> The impact of teaching systems is in large part a reflection of the relative success with which the professor correctly selects the appropriate teaching instruments and test items. Given the paucity of scientifically-based findings on the relative productivity of alternative teaching approaches and materials, the full potential of a teaching system approach to instruction will not be revealed until major advances are made in the more fundamental instructional areas of testing, diagnosis, and prescription. If the past can be taken as a rough guide to the future, notable advances in these areas of instruction, in economics or any other discipline, are not likely to be just around the corner.[34]

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[33]John Losak, Learning Theory and Applications, p. 42.

[34]Allen C. Kelley, "TIPS and Technical Change in Classroom Instruction," The American Economic Review, May 1972, p. 428.

INDIVIDUAL SUMMARY STATEMENT OF ROBERT M. FRANCIS

This study indicates additional usefulness for the computer in teaching the Principles of Accounting course. If the teaching profession is serious about improving instruction, this study provides tips galore: use of the computer can improve study habits, to highlight important concepts, to process data, to "individualize" instruction, to identify students' strengths and weaknesses, to provide prompt feedback to students, to keep records, and to increase motivation concerning the subject matter.

Some of this computer-assisted instruction diagnostic system will improve performance; some of it will improve student attitudes. Other aspects will reduce the drudgery of teaching for the instructor.

The study presents a system whereby each student can have successful learning experiences, letting students assume the major responsibility for their own learning process; affording students different learning styles for the same educational objectives. One of the most important elements of the system is the time factor; instead of waiting for several weeks to discover whether a student is having trouble, the instructor can discover this within a day or so.

Looking at the overall picture, it does appear that there is a need for further investigation if we wish to clearly establish the outcomes of the computer-assisted

instruction diagnostic method. The principal findings in reviewing the literature with regard to computer-assisted instruction is that future research is warranted. The implications would appear to be strongest for research with different teaching techniques. The real outcome of computer-assisted instruction systems may not be the better student performance, or the reduction of attrition to more comparable levels; however, the real advantage of such systems, may be less time needed in a particular course by students to generate a particular grade in the course.

According to Paden and others:

> The jury is still out in terms of deciding on the relative merits of computer-assisted instruction; however, many college departments consider computer-assisted instruction to be sufficiently effective to justify its continued use.[35]

This author views the outcome of this practicum investigation of the computer-assisted instruction diagnostic method as an approach to learning which may offer a workable method of providing individualized instruction to limit attrition.

According to Reed and others:

> There are several rewards which may accrue from the development of a computer-assisted instruction program. First, the teacher can redirect his efforts from routine teaching tasks, such as information-giving, to more personalized learning objectives.

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[35]Donald W. Paden and others, "A Decade of Computer-Assisted Instruction," The Journal of Economic Education, Fall 1977, Vol. 9, No. 1, p. 3.

> Second, the teacher may save time and effort in the long view, and third, the detailed discipline process required to create a computer-assisted instruction program may encourage the teacher to invest the art and science of teaching with greater meaning.[36]

As a final outcome of this practicum investigation, additional studies can be generated; also the instructor will generate more concern for the students who are failing a particular course.

Nawaz summarizes this participant's views with the following quote:

> The wide array of approaches, techniques, and methods shows evidence of a pragmatic response to the challenge of individualization. There is also increasing concern that the answer lies in diversity rather than uniformity; that there is no one best way of reaching students; and that any attempt at individualization should open up alternatives to the individual learner.[37]

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[36]Fay Carol Reed and others, "A Model for the Development of Computer-Assisted Instructional Programs," Educational Technology, Vol. IV, March 1974, p. 20.

[37]M. Nawaz and S. A. Tanveer, "Individualized Instruction: The Promise, Requisites and Alternatives," Educational Technology, Vol. XVII, March 1977, p. 25.

INDIVIDUAL SUMMARY STATEMENT OF DANIEL FITZGERALD

In developing this study the underlying need recognized by this author was that the Principles of Accounting course at Herkimer County Community College, (and other two-year, as well as four-year colleges) created a problem to students' progress and success. Many students drop the course, as evidenced by Appendix A, then repeated it later; some failed the course and again either repeated it later or dropped out of college.

This study provides a method of identifying the student who needs help immediately and provides a program of assistance and reinforcement. In addition, this study alerts the instructor to areas of the course that were not fully understood or covered for a majority of the students in that class.

The problem addressed by this study was to recognize students' weaknesses with the accounting material on a weekly basis and to provide the student with help and assistance. It was felt that student assistance was necessary to identify each student's problem in order to proceed to the next unit of study and not fall behind.

Through the computer-assisted instruction the instructor is able to continue his lecture program and also provide assistance to the student in need on a weekly and continuing basis. Thus this approach is both practical and workable

for the student and the instructor from the all important time consideration.

It is this author's belief that this method will allow the student having difficulty understanding the accounting material to keep pace with each class and also allow students to experience success.

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Appendix A

ATTRITION OF LATE ENTRANTS*

Fall 1970 - Spring 1978

Number of Students	% Passed	% Failed	% Withdrew
76	9	32	59

*According to Herkimer County Community College records maintained by Student Services.

Appendix B

COMPARISON OF ATTRITION RATES

Accounting I to: Introduction to Data Processing
Marketing I
Business Organization and Management
Business Law

Summary Analysis

Fall, 1975 - Spring, 1978

Course	Total Students	% Passed	% Failed/ Withdrew
Principles of Accounting	1091	73	25
Introduction to Data Processing	671	89	10
Marketing I	530	86	14
Business Organization & Management	741	85	14
Business Law	671	89	11

Appendix C

STUDENT CHARACTERISTICS - WHAT PERCENT IS ADULT POPULATION

Herkimer County Community College has a student enrollment of approximately 1400 full-time students and approximately 18 percent are classfied as adults.

Adult, by Herkimer County Community College's definition, is anyone 23 years of age or older. Twenty-three is a standardized figure determined by the State University System of New York to provide regional standardization of statistics.

Appendix D

SAMPLES OF SURVEY AND BEHAVIORAL OBJECTIVES FOR THE FIRST INSTRUCTIONAL UNIT

PART IA Survey to Determine the Degree of Mastery of the Learning Objectives for the Introduction to Principles of Accounting (First Week)

Instructions: Using a number 2 pencil, indicate the correct response for each of the following questions by darkening the appropriate box on the form. If you make an error, erase it completely or your response will be voided.

1. Accountants accumulate, analyze, and interpret data, and summarize this data in reports for use by a company's managers, investors, and others.

   True or False

2. The basic purpose of accounting is to provide financial information to economic decision makers.

   True or False

3. That accountants are expected to regard a business as distinct and apart from its owners is a concept known as:

   a. cost principle
   b. pay-as-you-go principle
   c. separate entity principle
   d. going concern principle
   e. none of the above

4. An alternative way of expressing the three basic elements used in accounting is Assets minus Liabilities equals New Worth.

   True or False

5. Properties owned by a business enterprise are referred to as liabilities.

True or False

6. Expenses are expired costs and are, therefore, located on the capital statement.

True or False

7. Debts need not be shown on the balance sheet as liabilities if they are not yet due.

True or False

8. A corporation's liabilities always represent claims against assets that rank ahead of the claims of stockholders or owners.

True or False

9. The financial statement that presents the assets, liabilities, and equity of a business enterprise is termed the balance sheet.

True or False

10. The financial statement that presents the equity, drawing or dividends, and the net increases or decreases in equity is termed the income statement.

True or False

11. The balance sheet is designed to show a company's financial position over a period of time, unlike the income statement which describes changes for a specific date.

True or False

12. The balance sheet presents the financial position; the income statement presents profits or losses of operations.

True or False

13. When the accrual basis of accounting is used, the revenues and expenses shown on the income statement need not relate to the same period of time.

True or False

14. The income statement summarizes only cash transactions.

True or False

15. When the accrual basis of accounting is used, any revenue earned but not yet collected in cash should be:

a. included in the capital statement
b. included in the income statement
c. excluded from the income statement
d. excluded from the capital statement
e. none of the above

PART IB Survey to Determine the Degree of Mastery of the Learning Objectives for the Introduction to Principles of Accounting (Second Week)

Instructions: Using a number 2 pencil, indicate the correct response for each of the following questions by darkening the appropriate box on the form. If you make an error, erase it completely or your response will be voided.

1. The accounting equation may be stated as Assets plus Liabilities equals owner's equity.

   True or False

2. The payment of a liability causes an increase in owner's equity.

   True or False

3. The purchase of an asset such as store equipment, either for cash or on account, causes no change in the owner's equity.

   True or False

4. The collection of an account receivable will cause total assets to increase.

   True or False

5. The payment of a liability will have no effect on owner's equity.

   True or False

6. A transaction which causes a decrease in an asset may also cause an increase in another asset or a decrease in a liability or a decrease in owner's equity.

   True or False

7. The total assets and stockholders' equity of a company are decreased by:

   a. repaying debts
   b. incurring expenses
   c. earning incomes
   d. purchasing equipment on account
   e. none of the above.

8. Net income is never reduced by the payment of dividends.

   True or False

9. If store equipment is acquired by making a cash payment of $800 and issuing a note payable for $2,800:

   a. owner's equity is decreased by $800
   b. total assets are increased by $3,600
   c. owner's equity is increased by $2,800
   d. total assets are decreased by $800
   e. none of the above

10. An increase in an expense account is the equivalent of a decrease in owner's equity.

    True or False

11. An income statement is the financial statement showing the income and expenses for a specific date.

    True or False

12. An income statement consists of a list of the company's income and liabilities for a period of time.

    True or False

13. A balance sheet is the financial statement showing the financial position of a business at a particular date. It consists of a list of the company's assets, liabilities, and owners' equity.

    True or False

14. The operating cycle is the period of time that a business usually takes to perform its function of buying (or making) inventory, selling the inventory, and collecting the accounts receivable generated by those sales.

    True or False

PART.IIA Behavioral Objectives for Chapter One

Introduction to Accounting Principles (First Week)

The Learning Objectives for this instructional unit are that the student will be able to:

1. Define accounting.
2. Define an entity.
3. Describe the three basic elements used in accounting as they apply to financial statements.
4. Identify the placement of the three basic elements used in accounting for the income statement, capital statement, retained earnings statement, and the balance sheet.
5. Prepare an income statement, capital statement, retained earnings and balance sheet when given specific financial information.
6. Contrast information presented on a balance sheet with information presented on an income statement.
7. Define the accrual basis of accounting.

PART IIB Behavioral Objectives for Chapter One

Introduction to Accounting Principles (Second Week)

The Learning Objectives for this instructional unit are that the student will be able to:

1. Apply the three basic elements to the accounting equation.
2. Identify increases or decreases in specific accounts when recording transactions.
3. List the order in which financial information is arranged on an income statement and on a balance sheet.
4. Describe the operating cycle of a business.

Appendix E

STUDENT PERFORMANCE SURVEY RESULTS

Principles of Accounting

The following information will be provided by the computer:

STUDENT NAME, ID DATA, SECTION, TIME, ETC.

SURVEY TIME DATA: DAY, WEEK, YEAR, NUMBER, ETC.

OTHER DATA: TEST VALIDITY

INFORMATION ON HOW MANY QUESTIONS WERE ANSWERED CORRECTLY, WHICH ONES WERE MISSED AND HOW THIS MATCHED UP WITH CLASS RESULTS AS A WHOLE. (This will give the student a good conceptual knowledge of where he is in relation to where he should be based on the class level of the material covered.)

REQUIRED (OPTIONAL) ASSIGNMENT:
(This assignment will give the student review and drill material in the items missed on this week's assignment as identified by the results of the survey - may be optional based on his score.)

OUTSIDE READING OR REFERENCE MATERIAL:
(This will be additional help material or new data based on an exceptional student's ability to go beyond the level of this particular class and thus create more of a challenge within the framework of the particular assignment and course.)

SPECIAL NOTICES:
(This area will contain a notice of special events at the college or elsewhere which pertain to this subject, reference to articles in the WALL STREET JOURNAL, etc. the students should review, and any other special communication to be achieved between teacher and student in this course.)

INSTRUCTOR FOLLOW UP:
(May be a request to see a student or group of students for special help or additional study in previously covered material not fully understood at this point as evidenced by the last survey; also for a student who has missed a large number of classes and is now in trouble in the course - for any reason.)

Appendix F

SAMPLE OF A STUDENT'S INDIVIDUALLY-TAILORED ASSIGNMENT
PART IA CORRECTIVE PRESCRIPTIONS FOR SURVEY NUMBER 1

Questions 1, 2, and 3

1. Read pages 13, 14, 16, and 17 entitled Bookkeeping and Accounting: Role of Accounting in Planning and Evaluating Results. Business Entity Concept, and the Cost Principle, respectively.
2. Answer questions 2 and 9 on page 28 in your textbook.
3. Filmosound Unit Module 1, Introduction to Accounting.
4. Pillsbury, Module 1.

Questions 4 and 5

1. Read page 18 entitled Assets, Liabilities, and Capital.
2. Filmosound Unit Module 2.
3. Pillsbury, Module 1.

Question 6

1. Read pages 24-25, entitled Balance Sheet, Income Statement and Capital Statement.
2. Examine page 26 as to location of specific accounts.
3. Filmsound Unit Module 3.

Questions 7 and 8

1. Read page 18 entitled Assets, Liabilities, and Capital.
2. Read page 19, Transaction C.

Questions 9, 10, 11, and 12

1. Read pages 24-28, entitled Accounting Statements.
2. Filmosound Unit Modules 2, and 3.

Questions 13, 14 and 15

1. Read pages 73, 74 and 212 entitled "Accruals".

PART IB CORRECTIVE PRESCRIPTIONS FOR SURVEY NUMBER 2

Question 1

1. Read page 18 entitled Assets, Liabilities, and Capital.
2. Pillsbury, Module 1

Questions 2 and 5

1. Read pages 19 and 20; transactions C and D.
2. Pillsbury, Module 1.

Questions 3 and 4

1. Read pages 19 and 21; transactions B and E.
2. Pillsbury, Module 1.

Questions 6 and 7

1. Read page 19, transaction B; page 20, transaction D; page 21, transaction F.
2. Pillsbury, Module 1.

Question 8

1. Read pages 27 and 28, Retained Earnings Statement-Corp.

Question 9

1. Read page 18, entitled Assets, Liabilities, and Capital
2. Pillsbury, Module 1.

Question 10

1. Read page 21 Transaction F
2. Pillsbury, Module 1

Questions 10, 11, 12 and 13

1. Read pages 24-28, entitled Accounting Statements.
2. Filmosound Units Modules 2 and 3.

Question 14

1. Read pages 87-88 entitled Fiscal Year

Appendix G

ADDITIONAL REINFORCEMENT ASSIGNMENTS

The following assignments may be completed at your option to further reinforce your understanding of those items that you missed on Survey Number 1:

1. View the Multimedia Program, Modules 1, 2, and 3 in the library. Modules cover the entity concept and statement preparation. A Module utilizes cassettes, filmstrips and a study guide that involves the student with a comprehensive self-paced program.

2. Listen to cassettes recorded by the instructor for the Instructional Unit: Introduction to Accounting Principles located in the library which correlates with your textbook.

3. Listen to Principles of Accounting: Audio-Cassette Study Guides, prepared by Wilbur F. Pillsbury. Modules consist of a brief discussion of a concept; illustrations are provided in a supplemental study guide, with corresponding exercises for the student to work on and includes a brief review.

Appendix II

COMPUTER REPORT FOR THE STUDENT AND THE TEACHER (SAMPLE)

Survey Numer 1 (date)
Accounting Principles and Practices

You answered correctly 8 out of the 15 questions on this survey. The following table summarizes your answers. Please review all incorrect responses and complete the assignments that are prescribed in Part II.

TABLE OF RESPONSES

Question Number	Correct Response	Your Response
1	True	True
2	True	True
*3	C	D
4	True	True
5	False	False
*6	False	True
7	False	False
*8	True	False
9	True	True
*10	False	True
11	False	False
*12	True	False
*13	False	True
14	False	False
*15	B	C

* represents an incorrect response

Appendix I

EXAMPLE OF TEACHER INFORMATION SURVEY RESULTS

QUESTION ANALYSIS OF PART I, CHAPTER I

Question Number	Correct Answer	Percent of class selecting other answers A(True)	B(False)	C	D	E
1	True	70	30			
2	True	65	35			
3	C	10	0	60	20	10
4	True	80	20			
*5	False	75	25			
6	False	25	75			
7	False	20	80			
8	True	60	40			
9	True	70	30			
10	False	40	60			
11	False	15	85			
12	True	45	55			
13	False	5	95			
*14	False	70	30			
*15	B	40	30	15	8	7

*Note responses to questions 5, 14 and 15. This provides clues to the teacher that a large percentage of students have missed significant items, thus the teacher can redirect his class lectures for the next class session.

Appendix J

DEVELOPING AN INSTRUMENT TO MEASURE STUDENT ATTITUDES

It was necessary to develop instruments for measuring the students' attitudes toward the computer-assisted instruction diagnostic method of teaching the Principles of Accounting course.

Two questionnaires were developed; the first was distributed to each student who completed the course to demonstrate whether or not the expectations were met. The second questionnaire was given to each student who withdrew from the course to determine the reason for withdrawal and their attitude towards the new system.

Appendix K

QUESTIONNAIRE FOR STUDENTS WHO COMPLETE THE PRINCIPLES OF ACCOUNTING COURSE

Instructions: Do not sign your name to this questionnaire!

Please help evaluate the Principles of Accounting course by completing this questionnaire. Using the number codes provided, circle the number after each statement which most nearly reflects your opinion of the area being rated. Circle one, but only one, number after each statement.

9 = Excellent
8 = Very Good
7 = Good
6 = Above Average
5 = Not Sure or No Opinion
4 = Below Average
3 = Poor
2 = Very Poor
1 = Unacceptable

A. Evaluation of the Course

1.	Definition of course objectives	9 8 7 6 5 4 3 2 1
2.	Coursework assignments and learning exercises	9 8 7 6 5 4 3 2 1
3.	Presentation level of materials	9 8 7 6 5 4 3 2 1
4.	Fairness of the grading system	9 8 7 6 5 4 3 2 1
5.	Practical and Professional value of the course	9 8 7 6 5 4 3 2 1
6.	Overall opinion of the Principles of Accounting course	9 8 7 6 5 4 3 2 1

B. Evaluation of Instructor and Teaching Practices

1.	Knowledge of the subject matter	9 8 7 6 5 4 3 2 1
2.	Quality of speech	9 8 7 6 5 4 3 2 1
3.	Sense of humor	9 8 7 6 5 4 3 2 1
4.	Ability to stimulate and maintain student interest	9 8 7 6 5 4 3 2 1
5.	Ability to tolerate other's opinions	9 8 7 6 5 4 3 2 1
6.	Fairness to students	9 8 7 6 5 4 3 2 1
7.	Overall opinion of the instructor	9 8 7 6 5 4 3 2 1

C. Evaluation of Computer-Diagnostic Method

1.	Indicated key concepts and areas of importance	9 8 7 6 5 4 3 2 1
2.	Pinpointed areas of weakness sooner	9 8 7 6 5 4 3 2 1
3.	Reduced apprehension prior to taking major examinations	9 8 7 6 5 4 3 2 1
4.	Reduced boredom due to lack of challenge	9 8 7 6 5 4 3 2 1
5.	Surveys did not accurately reflect knowledge of material and thus give a false sense of confidence	9 8 7 6 5 4 3 2 1
6.	The system increased the tendency to do assigned reading prior to the next class session	9 8 7 6 5 4 3 2 1
7.	The system increased the frequency of reviewing the covered materials	9 8 7 6 5 4 3 2 1
8.	The system results in greater retention of the subject matter	9 8 7 6 5 4 3 2 1
9.	The system has an effect on motivation	9 8 7 6 5 4 3 2 1
10.	The system is most valuable as an identifier of key strengths and weaknesses	9 8 7 6 5 4 3 2 1
11.	The system provided individually tailor-made assignments to meet your needs	9 8 7 6 5 4 3 2 1
12.	The system better identified your expectations of the course	9 8 7 6 5 4 3 2 1
13.	The system provided an opportunity to take a more active role in learning	9 8 7 6 5 4 3 2 1
14.	The system provided immediate feedback to reinforce the learning of subject matter	9 8 7 6 5 4 3 2 1
15.	The system provided small instructional units that enabled the learning of more complicated subject matter	9 8 7 6 5 4 3 2 1

D. Evaluation of Teaching Method Used

How useful is the computer as a learning tool in teaching the Principles of Accounting course?

5 = Extremely valuable
4 = Valuable
3 = Not sure or no opinion
2 = Not very valuable
1 = Of no value

RECOMMENDATIONS

What recommendations would you make in regard to. . .

1. The course content _____

_____

_____

_____

2. The teaching method used _____

_____

_____

_____

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Appendix L

QUESTIONNAIRE FOR STUDENTS WHO DROP THE

PRINCIPLES OF ACCOUNTING COURSE

NAME _____

INSTRUCTOR _____

Please check any answers that apply and add any comments.

_____ The material is too difficult.

_____ The material is too easy.

Comments: _____

_____

Please rate the material used in this course.

	Good	Average	Poor
Textbook	_____	_____	____
Surveys	_____	_____	____
Lectures	_____	_____	____

(To be answered only by students using the lab material)

Tapes and study guides	_____	_____	____

Comments: _____

_____

(To be answered only by students who are not using the lab material)

Yes _____ No _____ Do you feel that the use of taped material and study on an individual basis would help you in this course?

Comments: _____

_____

(All Students)

Yes _____ No _____ Do you feel you have sufficient opportunity to discuss problem material with the instructor?

Comments: _____

_____

PLEASE MAKE ADDITIONAL COMMENTS THAT YOU FEEL WOULD IMPROVE THIS CLASS ON THE REVERSE SIDE OF THIS QUESTIONNAIRE.